SUBBOTIN, V.I. (Moskva); KOZLOV, F.A. (Moskva); IVANOVSKIY, N.N. (Moskva)

Heat transfer to sodium under the combined action of free and forced convection and with precipitation of oxides on the heat exchange surface. Teplofiz. vys. temp. 1 no.3:409-415 N-D '63. (MIRA 17:3)

AID Nr. 987-3 11 June

HEAT TRANSFER OF LIQUID METALS IN PIPE FLOW (USSR)

Subbotin, V. I., P. A. Ushakov, E. N. Gabrianovich, V. D. Talanov, and I. P. Sviridenko. Inzhenerno-fizicheskiy zhurnal, v. 6, no. 4, Apr 1963, 16-21. S/170/63/000/004/002/017

The Physics and Power Engineering Institute in Obninsk studied heat transfer from Hg at 18 to 30°C and from NaK alloy (22% Na, 78% K) at 70 to 110°C. Three test sections were used. The first consisted of a machined steel tube (20-mm diameter, 0.3-mm wall thickness) to which copper rings (48-mm diameter) were welded at 1-mm intervals. The thermocouples were located inside the copper rings. The second section contained a nickel tube (12-mm diameter, 0.4-mm wall thickness) also equipped with copper rings. The third section consisted of a machined copper tube with a 40-mm outer and a 20.8-mm inner diameter. Two series of experiments were conducted with NaK: 1) at $470 < Pe < 7900$, with oxide contents in the metal ranging from $3 \cdot 10^{-4}$ to $7 \cdot 10^{-4}$ wt %; 2) at $107 < Pe < 640$, with oxide contents of 1.10^{-3} to $5.2 \cdot 10^{-3}$ wt %. The results showed that the Nusselt number for Hg in nickel and steel tubes and for NaK in copper tubes is identical. This indicates

Card 1/2

AID Nr. 983-3. 11 June

HEAT TRANSFER OF LIQUID METALS IN PIPE FLOW [Cont'd] S/170/63/000/004/002/017

heat thermal contact resistance is practically absent under the conditions studied. Oxides in concentrations from $3 \cdot 10^{-4}$ to $5 \cdot 10^{-3}$ wt % did not affect heat [illegible] for in NaK. The following formula is recommended at $0.002 \ll Pr \ll 0.003$ and $20 \ll Pe \ll 1000$ for metals containing oxides in concentrations below the solubility limit: $Nu = 4.3 + 0.025\ Pe^{0.8}$.

[PV]

Card 2/2

L 12924-63 EPR/EPF(c)/EPF(n)-2/EWT(l)/EWP(q)/EWT(m)/BDS ASD/AFFTC/SSD
Pr-4/Pu-4/Ps-4 WW/JD
ACCESSION NR: AP3000684 S/0096/63/000/006/0070/0074 15

74

AUTHOR: Subbotin, V. I. (Doctor of technical sciences); Ibragimov, M. Kh. (Candidate of technical sciences); Nomofilov, Ye. V. (Engineer)

TITLE: Measurement of temperature fields in turbulent flow of mercury in a pipe 27

SOURCE: Teploenergetika, no. 6, 1963, 70-74

TOPIC TAGS: turbulent heat transfer coefficient, radial temperature profile

ABSTRACT: Radial temperature profiles in mercury flowing upward in a vertical tube of 1Kh18N9T steel (outer diameter, 34 mm; inner diameter, 29.3 mm; length, 1300 mm) were determined by a moving temperature probe equipped with two alumel-chromel thermocouples. The tube was heated by a nichrome strip and the probe was driven by a worm gear mechanism with an electric motor. The experimental parameters were as follows: Re, 19,300—410,000; average mercury temperature, 10.1—41.1C; temperature difference between the mercury and the tube wall, 3.2—6.33C; and flow velocities, 0.08—1.72 m/sec. Measurements were made at 12 points located 0.25—14 mm from the tube wall. The temperatures were recorded for 30—50 sec by an EPP-09 high-speed automatic potentiometer, and the average readings were plotted on a dimensionless temperature versus distance graph.

Card 1/2

L 12924-63
ACCESSION NR: AP3000684

The wall temperature was obtained by extrapolation of the profiles. The turbulent heat transfer coefficient (ε_a) was calculated from the local heat fluxes, the heat flux through the wall, and the temperature gradients obtained from the profiles by graphical differentiation. The value of ε_a increased with increasing Re and with increasing distance from the wall, attaining a maximum at $r/r_0 = 0.2-0.3$. In the center of the tube (r/r_0 is less than 0.2), accurate values of ε_a could not be determined because of the considerable inaccuracy in the temperature gradients. The thermal mixing length was also determined and plotted against the r/r_0. To gain further insight into the heat transfer mechanism, it is suggested that experiments be carried out in which ε_a is determined with sufficient accuracy in the center and the wall zone. Orig. art. has: 5 figures, 3 tables, and 6 formulas.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 21Jun63 ENCL: 00

SUB CODE: NS NO REF SOV: 003 OTHER: 004

Card 2/2

SUBBOTIN, V.I., doktor tekhn. nauk, prof.; ZENKEVICH, B.A., kand. tekhn. nauk; ALEKSEYEV, G.V., inzh.

Critical heat flow in annular channels. Teploenergetika 10 no. 0: 72-75 0'63 (MIRA 17:7)

SUBBOTIN, V.I

AID Nr. 978-4 28 May

RELATIONSHIP BETWEEN TURBULENT HEAT-TRANSFER COEFFICIENTS AND MOMENTUM (USSR)

Subbotin, V. I., M. Kh. Ibragimov, and Ye. V. Nomofilov. Atomnaya energiya, v. 14, no. 4, Apr 1963, 414-416. S/089/63/014/004/016/019

In a study of heat transfer in turbulent flow of liquid metal, the heat-transfer and momentum-transfer coefficients have been calculated from experimental temperature fields obtained with liquid metal flowing in a pipe at Pr = 0.025 and Re = 20,000 to 450,000. The calculations show that 1) the ratio between the coefficients of turbulent heat transfer and momentum depends on the Reynolds number, and 2) the turbulent transfer of momentum and the coefficient of dissimilarity ε between turbulent heat transfer and momentum depend on the flow velocity distribution law. However, the velocity distribution has very little effect on the variation of ε along the pipe radius. It is stated that the turbulent heat-transfer theory can be developed only on the basis of direct experimental study of actual parameters, including velocity pulsations, temperature, and the statistical correlations between the two. [AS]

Card 1/1

ACCESSION NR: AT4042307 S/0000/63/003/000/0297/0307

AUTHOR: Gushchin, G.I., Loginov, N.I., Subbotin, V. I.

TITLE: Measuring the velocity profile by an electromagnetic method

SOURCE: Soveshchaniye po teoreticheskoy i prikladnoy magnitnoy gidrodinamike. 3d, Riga, 1962. Voprosy* magnitnoy gidrodinamiki (Problems in magnetic hydrodynamics); doklady* soveshchaniya, v. 3. Riga, Izd-vo AN LatSSR, 1963, 297-307

TOPIC TAGS: hydromagnetics, velocity measurement, flow meter, velocity profile, electromagnetic velocity measurement, induction current, potential gradient measurement

ABSTRACT: The authors describe the essential features of an electromagnetic method for velocity measurement. This method is based on the induction of an EMF in a conductor travelling within a magnetic field. The distribution of potentials in the electroconductive liquid flowing in the magnetic field is uniquely related to the distribution of velocities in the liquid. A mathematical explanation of the method is given. The point is made that in order to obtain a velocity distribution by this method, the potential distribution and the mean velocity of the flow must be measured. A single moving electrode, introduced into the flow, with the tubing wall used as the second electrode, is

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ACCESSION NR: AT4042307

sufficient for potential measurements in a liquid. Attention is called, however, to the difficulty involved in differentiating an experimentally measured potential distribution. In this connection, a two-electrode method for measuring the potential gradient is considered in the article. The authors note that with a velocity gradient present, circular currents arise in the liquid. In the first place, these currents give rise to an additional voltage drop in the liquid, thus distorting the potential gradient profile. In the second place, the presence of currents in the liquid leads to the occurrence of electromotive forces, which distort the velocity profile. With regard to the first effect, the authors demonstrate that measurements can be conducted with conventional unshielded electrodes and at an angle of 90° to the direction of the magnetic field. Since the magnitude of the EMF is proportional to the square of the magnetic induction, by reducing the latter, the second effect can be held to a minimum. The experimental stand, associated apparatus and the experiments themselves are described in a separate section of the paper. In addition to the basic system, the stand contained a system for the continuous purification of the metal and a measuring tank for the calibration of the flow meters by the volumetric method. Input and output of the metal was effected through mixing chambers. The experimental segment in this case was a tube of stainless steel,

ACCESSION NR: AT4042307

type 1Kh18N9T. A cone-shaped probe, 335 mm in length, was introduced from the output end into the segment. The probe terminated in two electrodes, whose ends were located at a distance of 1.3 mm from one another. The electrode was a wire, 0.1 mm in diameter, covered with an alundum insulation and inserted into a stainless steel capillary with an outer diameter of 0.4 mm. The probe was equipped with a special device, employing an electric motor, to permit the movement of its end over any diameter in one section of the tubing. Two series of experiments were run. In the first series, the magnetic field was generated by a permanent magnet and a single-electrode probe was used. It was found that the potentials increase, for the most part, linearly, with "bends" occurring only in the immediate vicinity of the tube walls. The results are analyzed in the article. In the second set of tests, the field was created by a DC electromagnet and a twin-electrode probe was employed. The experimental profile in this case was found to be flatter than the theoretical. Having discovered, in the course of the experimentation, severe distortion of the velocity profile at an inductance of about 6,000 gauss, the authors attempted to estimate the permissible magnitude of magnetic induction, at which distortions are negligible. The final section of the article deals with this problem. The general conclusions drawn from this study are the circular currents in the liquid do not distort the form of the potential gradient profile in the direction perpendicular to the magnetic field, and that distortion of the velocity profile by magnetic forces is very severe. This effect

ACCESSION NR: AT4042307

may be avoided by reducing the magnitude of the magnetic induction, but this requires apparatus of extremely high sensitivity, permitting the measurement of signals on the order of 1 microvolt. Orig. art. has: 5 figures and 18 formulas.

ASSOCIATION: none

SUBMITTED: 04Dec63 ENCL: 00 SUB CODE: EM, ME

NO REF SOV: 001 OTHER: 003

Card 4/4

IBn&GIM[illegible],E.n.n.;[illegible]FILOV,YE.V.;SUBBOTIN,V.I. (Obninsk)

"Statistical analysis of turbulent temperature pulsation in fluid flow"

report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow, 29 Jan - 5 Feb 64.

GRAFUTIN, V. I.; SUBBOTIN, V. I.; SUVOROV, L. Ya.

"Heat transfer in liquid-metal-cooled reactor elements."

report submitted for 3rd Intl Conf, Peaceful Uses of Atomic Energy, Geneva, 31 Aug-9 Sep 64.

ACCESSION NR: AP4024192 S/0294/64/000/001/0071/0077

AUTHOR: Subbotin, V. I.; Ibragimov, M. Kh.; Nomofilov, Ye. V.

TITLE: Statistical investigation of turbulent temperature pulsations in a liquid stream

SOURCE: Teplofizika vy*sokikh temperatur, no. 1, 1964, 71-77

TOPIC TAGS: temperature pulsation in stream, turbulent temperature pulsation, turbulent water stream, turbulent liquid metal stream, autocorrelation function, correlation function, normalized autocorrelation function, jet shaped turbulence, semiempirical turbulence theory, normalized correlation function

ABSTRACT: Results are reported of measurements of temperature pulsations in turbulent streams of water and liquid metal, measurements of the normalized autocorrelation and mutual correlation functions, and measurement of the turbulence scales. A stainless steel tube with specially treated internal surface was used for the flow, and a motor driven thermocouple probe was used to plot the temperature distribution. Various measurement steps are detailed. It is concluded that the turbulent-disturbance region is

Card 1/3

ACCESSION NR: AP4024192

cylindrical in form, so that the disturbances themselves are shaped like jets and cannot be represented by small spheres as is extensively done in semiempirical turbulence theories. Orig. art. has: 7 figures and 8 formulas.

ASSOCIATION: none

SUBMITTED: 03Sep63 DATE ACQ: 16Apr64 ENCL: 01

SUB CODE: PH NO REF SOV: 006 OTHER: 004

Card 2/3

ACCESSION NR: AP4037634 S/0096/64/000/006/0020/0022

AUTHOR: Zenkevich, B. A. (Candidate of technical sciences); Peskov, O. L. (Candidate of technical sciences); Subbotin, V. I. (Doctor of technical sciences)

TITLE: Investigation of critical heat flux for tubular fuel elements of an atomic power plant

SOURCE: Teploenergetika, no. 6, 1964, 20-22

TOPIC TAGS: atomic reactor, atomic power plant, reactor operation, critical heat flux, boiling crisis

ABSTRACT: The authors investigated the boiling crisis during forced flow of underheated water in tubes containing a steam-water mixture. To eliminate the effect of tube diameter all experiments were performed on tubes with I.D. of 8-9 mm; tube lengths varied from 180 to 2100 mm, and pressures were 392-981 n/cm^2. The mass velocity of the water exhibited an ambiguous effect on the critical heat flux: in the region of underheated water both positive and negative effects were observed. In the region of the steam-water mixture the critical heat flux decreased with an increase in mass velocity over the entire range of velocities and

Card 1/2

APPROVED FOR RELEASE: 08/26/2000 CIA-RDP86-00513R001653720002-5"

L 10425-65
ACCESSION NR: AP5027439

2

(nomenclature was not explained) described the experimental results with a maximum

ACCESSION NR: AP4044529 S/0294/64/002/004/0616/0622

AUTHORS: Subbotin, V. I. (Moscow); Ivanovskiy, M. N. (Moscow); Sorokin, V. P. (Moscow); Chulkov, B. A. (Moscow)

TITLE: Heat exchange during condensation of potassium vapor

SOURCE: Teplofizika vysokikh temperatur, v. 2, no. 4, 1964, 616-622

TOPIC TAGS: potassium, condensation, thermal property, boundary effect/ 1Kh18N9T steel

ABSTRACT: The authors designed special apparatus for their experiment. Saturated vapor was introduced into a cylindrical chamber 150 mm in diameter and 210 mm in height, on the bottom of which was placed an experimental condenser--a cylinder of 1Kh18N9T steel 62 mm in diameter and 35 mm in height. The lower part of the cylinder was cooled with water. The upper part, framed by a wall 6 mm high, served as a tray for the condensate. The vapor was condensed on the surface of liquid metal, and the condensate was discharged through the side of the tray. Temperature measurements were made only after steady thermal conditions had been established. The measurements were continued for 1-1.5 hours, with no change in

Card 1/2

ACCESSION NR: AP4044529

temperature exceeding 2C during the measurements. During condensation of the metal vapor, one might expect intense heat exchange because of the high thermal conductivity of the condensate. But boundary effects are found to play an important role when thermal resistance of the condensate is small. These effects include contact thermal resistance (due to contamination on the walls), resistance during phase transition (because of temperature jumps between vapor and the liquid surface), and diffusion resistance (caused by impurities of uncondensed gases and metal vapor). This paper furnishes the first experimental data on the role of boundary effects on heat exchange during condensation of immobile potassium vapor. "Apart from the authors, V. I. Lukashov, N. V. Bakulin, and A. V. Kleymenov participated in this work." Orig. art. has: 5 figures and 2 tables.

ASSOCIATION: none

SUBMITTED: 19Apr64 ENCL: 00

SUB CODE: TD, ME NO REF SOV: 004 OTHER: 004

Card 2/2

[illegible], G. A., kand. tekhn. nauk; [illegible], O. I., kand. tekhn. nauk;
[illegible], V. A., doktor tekhn. nauk

Study of critical thermal currents in tubular heat emitting elements of atomic electric power plants. Teploenergetika 11 no.6:20-22 Je '64. (MIRA 18:7)

L 5172-66 EPA(s)-2/EWT(m)/EPF(n)-2/T/EWT(t)/EWP(b) IJP(c) JD/WW/
ACCESSION NR: AT5022450 JG/GS UR/0000/65/000/000/0001/0022

AUTHOR: Subbotin, V. I.; Ushakov, P. A.; Zhukov, A. V.; Talanov, V. D.; Kudryavtseva, L. K.; Sviridenko, Ye. Ya.; Vasil'yeva, L. V.

TITLE: Investigation of the temperature distribution in core and shield elements of BN-350 reactor by means of experimental models

SOURCE: Obninsk. Fiziko-energeticheskiy institut. Doklady, 1965. Eksperimental'noye issledovaniye na modelyakh poley temperatury teplovydelyayushchikh elementov aktivnoy zony i ekrana reaktora BN-350, 1-22

TOPIC TAGS: nuclear power reactor, fast reactor, liquid metal cooled reactor

ABSTRACT: The distribution of temperatures in various parts of a 350 Mw fast-neutron sodium-cooled reactor was investigated by means of two special experimental models. The first model consisting of two loops was similar to the core of the BN-reactor while the second model was arranged for investigation of heat transfer in the shielding area. Particular attention was given to the centrally and peripherally located fuel elements that is to the fuel assemblies submitted to different heat transfer conditions. The core primary

Card 1/2

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L 5172-66
ACCESSION NR: AT5022450

loop was cooled by sodium while a sodium-potassium compound was used as coolant for the secondary core loop as well as for fuel elements placed within lateral shields. The core model consisted of 37 tubes of which 34 tubes were provided with special welded fins. The shield model had an assembly of 19 tubes. A detailed description of the experiments was given and the results were analyzed. The irregularities in temperature distribution were graphically presented in 10 figures. It is proposed to resume the research on temperatures by using new models because the evaluation of temperature ranges and gradients on outer peripheral elements was not sufficiently reliable. Introductory information is also given on BN-350 reactor as well as on some heat transfer problems. Orig. art. has: 3 diagrams and 10 graphs.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: NP

NO REF SOV: 000 OTHER: 000

Card 2/2

L 65197-65 EWT(l)/EWP(m)/EWA(d)/FCS(k)/EWA(l)
ACCESSION NR: AP5006297 S/0096/65/000/003/0047/0051
621.1.016.4

AUTHOR: Alekseyev, G. V. (Engineer); Remizov, O. V. (Engineer); Sergeyev, N. D. (Engineer); Zenkevich, B. A. (Candidate of technical sciences); Peskov, O. L. (Candidate of technical sciences); Subbotin, V. I. (Doctor of technical sciences)

TITLE: Critical heat fluxes during forced flow of water

SOURCE: Teploenergetika, no. 3, 1965, 47-51

TOPIC TAGS: fluid flow, forced flow, flow analysis, external flow, internal flow

ABSTRACT: The authors examine experimental data on the boiling crisis during forced flow of underheated water and of a water-steam mixture in tubes. These data are compared with those on external flow around an isolated tube in a symmetric annular space, flow around a tube located along the axis of a square channel, and external longitudinal flow over bundles of tubes. Some of the data given in this paper are from previously published works by these authors. The results are given in a series of graphs. It is found that q_{cr} is inversely related to pressure for water flow within the tubes. The dependence on pressure is reduced when the mass velocity of

Card 1/2

L 65197-65
ACCESSION NR: AP5006297

the water flow is increased. For flow within tubes, q_{cr} is inversely related to the enthalpy of the water in the crisis zone, the effect of enthalpy increasing with the rate of flow of the water. The complex relationship between q_{cr} and various combinations of parameters is discussed for external longitudinal flow. There is a theoretical difference between the cases of internal and external cooling with respect to the effect of flow parameters and secondary factors on q_{cr} in external flow. Care should be taken when generalizing experimental data not to depend on extrapolation into regions where there is no reliable empirical basis for this procedure, since experience has shown that q_{cr} is sometimes a complex function of the flow parameters and various secondary factors. Orig. art. has: 8 figures.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: ME

NO REF SOV: 012 OTHER: 002

Card 2/2

EWT(m)/EPF(c)/EPF(n)-2/EPR/EWG(m)/T/EPA(bb)-2/

sodium

Teplofizika vysokikh temperatur, v. 3, no. 1, 1965, 154-163

ACCESSION NR: AP[illegible]

small experimental set-ups and alloy traps are better for larger ones. Hot traps are based on the getter principle, with the getter reducing the sodium oxide to [illegible]. Recommended getters are zirconium, uranium, titanium, and thorium [illegible]. The properties [illegible]

SUB CODE: NP, GC

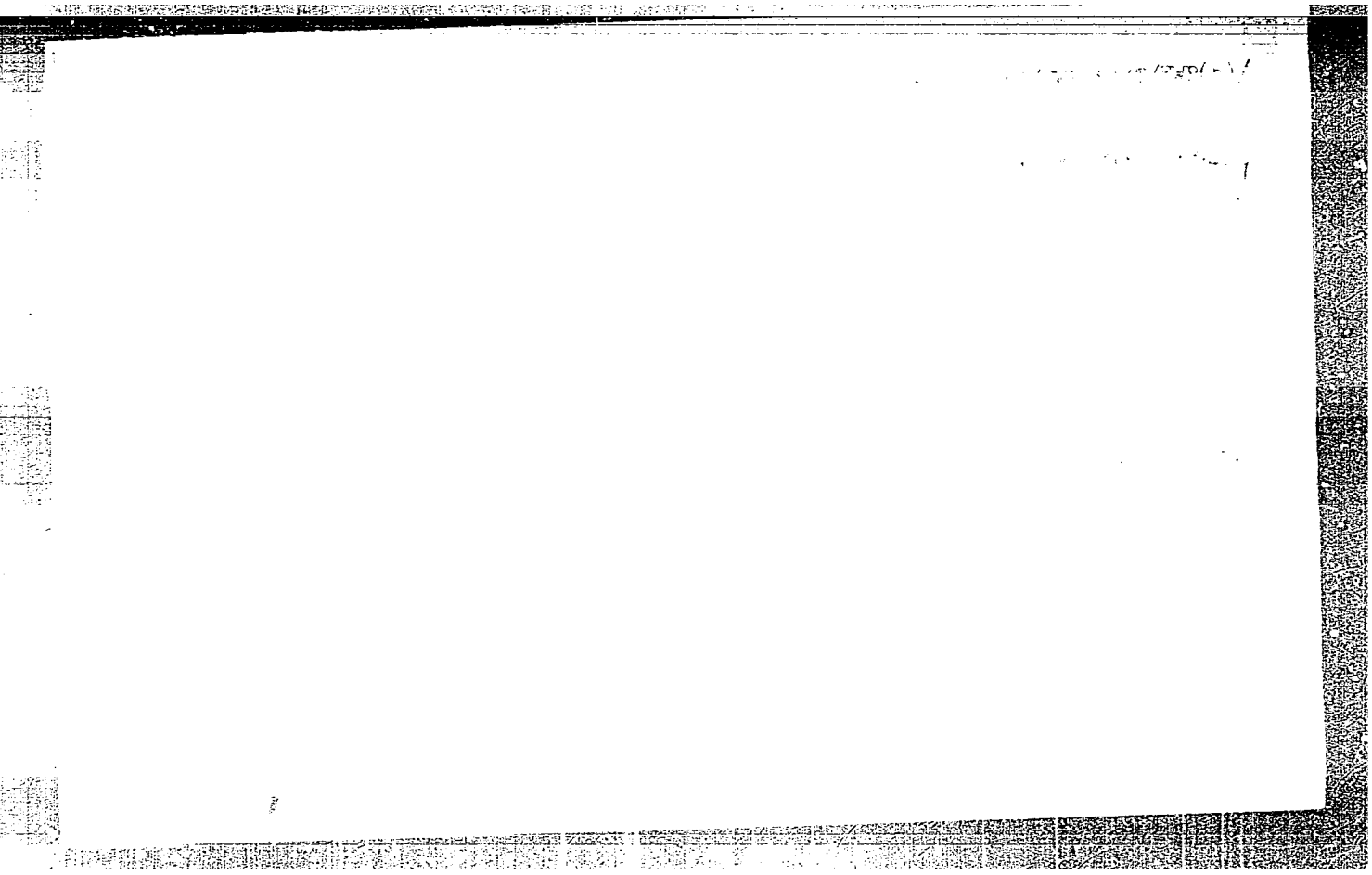
NO REF SOV: [illegible]

OTHER: [illegible]

Card 2/2

SUBBOTIN, V.I. (Moskva); IBRAGIMOV, M.Kh. (Moskva); NOMOFILOV, Ye.V. (Moskva)

Generalizing dependence of the coefficient of turbulent heat transfer in a liquid flow. Teplofiz. vys. temp. 3 no.3:421-426 My-Je '65. (MIRA 18:8)



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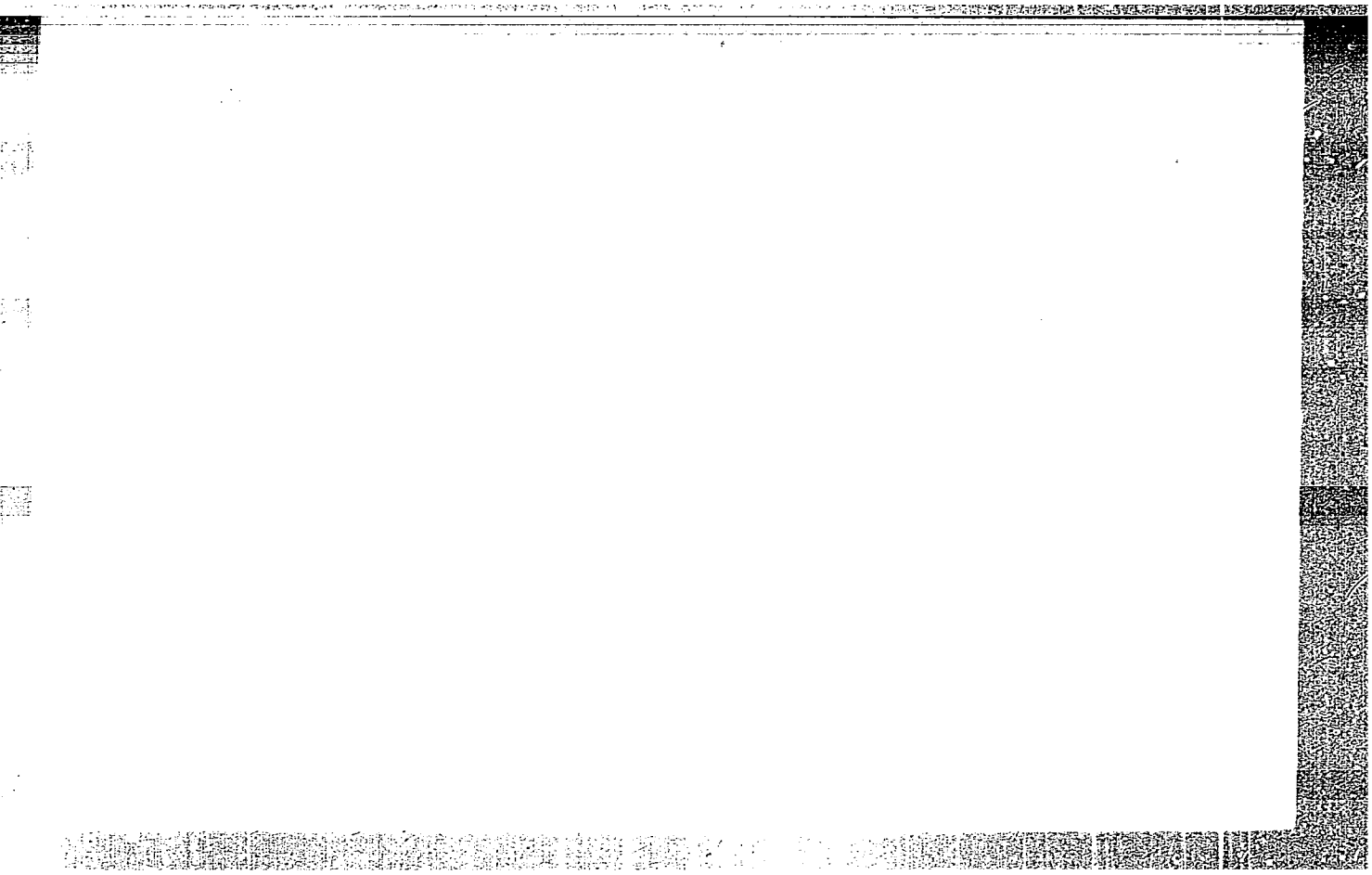

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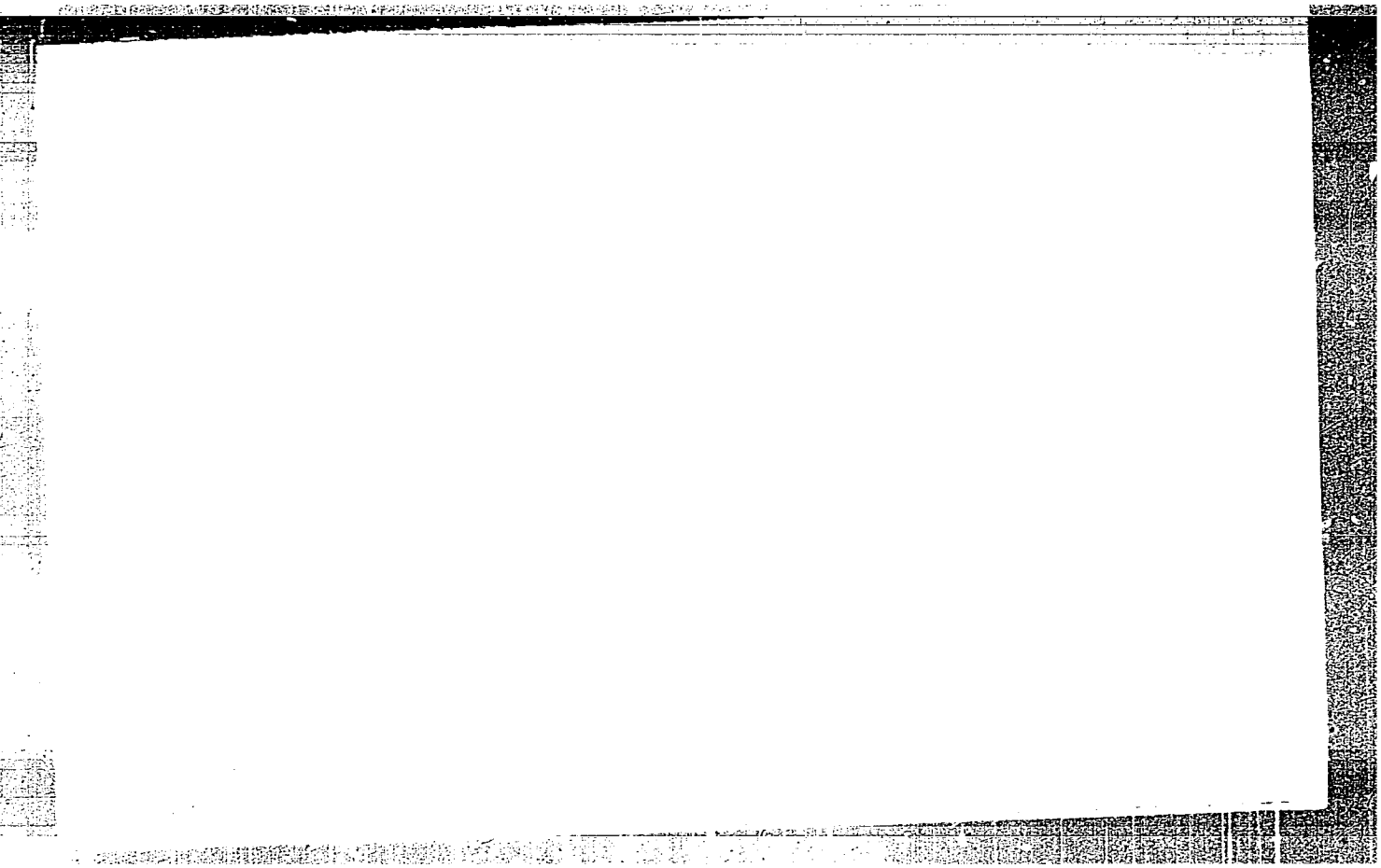

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L 21989-66 EWT(1)/EWP(m)/EWA(d)/EWA(1)
ACCESSION NR: AP5025985 UR/0294/65/003/005/0708/0716
532.542.4:546.49:536.5.001.5

AUTHOR: Bobkov, V. P. (Moscow); Gribanov, Yu. I. (Moscow); Ibragimov, M. Kh. (Moscow); Nomofilov, Ye. V. (Moscow); Subbotin, V. I. (Moscow)

TITLE: Measurement of temperature pulsation intensity in the turbulent flow of mercury in a tube

SOURCE: Teplofizika vysokikh temperatur, v. 3, no. 5, 1965, 708-716

TOPIC TAGS: mercury, turbulent flow, ~~pulsocoooter~~; temperature stabilization, flow meter/Type 46K1 flow meter

ABSTRACT: The temperature pulsations were measured with two thermocouples, located in a single probe. Location of the thermocouples in the experimental section was accurate to ±0.1 mm. The experimental tube had a diameter of 52.2 mm, and was placed vertically. The length of the hydrodynamic and thermal stabilization zone was 30 tube diameters. In some experiments, a grid with an effective section equal to 30% of the cross section of the tube was placed at the inlet of the tube. This grid was a steel plate 2 mm thick with 2.5 mm diameter openings in a square pattern with a spacing of 4 mm. The mercury was circulated in the loop by a Type TsN-2 centrifugal pump. The heat flux was created by an electric heater, and the temperature of the mercury was measured with Chrom-

Card 1/2

L 21989-66
ACCESSION NR: AP5025985

el-Alumel thermocouples. The statistical characteristics of the flow were measured and automatically recorded with a Type 46K1 correlation meter. The amplifiers had a transmission band from 0.18 to 300 cycles at a level of 0.9. A block diagram of the measuring scheme is given. The temperature pulsation intensity was measured over a Reynolds number range from 5×10^3 to 125×10^3 and a heat flux at the wall from 10^4 to 2×10^4 kcal/m^2-hr, at different inlet conditions. Results are given in tabular form. Analysis of experimental data shows that with a rise in the Reynolds number, the observed nonhomogeneity of the pulsations along the radius of the tube gradually disappears and the maximum intensity degenerates. Comparison of the experimental data for mercury and water indicate that with a rise in the Prandtl number at constant Reynolds number, the maximum intensity of turbulent temperature pulsations becomes more marked and approaches the tube wall. Orig. art. has: 6 figures and 1 table

ASSOCIATION: None
SUBMITTED: 31Jul64 ENCL: 00 SUB CODE: 20
NR REF SOV: 007 OTHER: 005

Card 2/2

[illegible] Ye. V.,

[illegible] of intense convective heat exchange

SOURCE: Atomnaya energiya, v. 18, no. 5, 1965, 525-527

TOPIC TAGS: heat exchange, Reynolds number, heat convection, temperature pulsation

[illegible]

L 55109-65
ACCESSION NR: AP5014545

...ments were carried out in the Reynolds number ... with ...

SUB CODE: ID, ME

NO REF SOV: 006 OTHER: 000 ATD PRESS: 4024

Card 2/2

L 1927-66 EPA(s)-2/EWT(m)/EPF(c)/EPF(n)-2/EWA(d)/T/EWP(t)/EWP(z)/EWP(b) MJW/JD/
ACCESSION NR: AP5023777 WW/JG/WB/DM UR/0089/65/019/003/0298/0300
621.039.534.6

AUTHOR: Subbotin, V. I.; Kirillov, P. L.; Kozlov, F. A.; Ivanovskiy, N. N.; Makarov, V. M.

TITLE: Removal of the products of interaction with water from sodium in a circulation loop

SOURCE: Atomnaya energiya, v. 19, no. 3, 1965, 298-300

TOPIC TAGS: sodium, sodium compound, nuclear power plant, liquid metal cooled reactor

ABSTRACT: In high-capacity nuclear power plants, the use of a "sodium-water steam generator with a single heat-transfer wall is very promising. However, a substantial amount of water may reach the sodium loop, and an important problem is the removal of products formed by the reaction with water from the sodium. The present study is made in a standard sodium circulation loop. The removal of sodium hydride is investigated by introducing hydrogen and using a cold trap to filter the sodium. Experiments on removal of products of the reaction with water

$$4Na + H_2O \rightarrow Na_2O + 2NaH$$

1/2

L 1927-66

ACCESSION NR: AP5023777

were similar. The data show that the purification of sodium involving removal of hydrogen, Na_2O and 2NaH by means of the cold trap and the monitoring of the content of these substances are fully satisfactory. No signs of corrosion are observed on 1Kh18N9T steel at 400C after a 2000-hr. contact with the sodium-water reaction products. Orig. art. has: 3 figures.

ASSOCIATION: none

SUBMITTED: 01Mar65 ENCL: 00 SUB CODE: NP, GC

NO REF SOV: 003 OTHER: 001

2/2

ACC NR: AP6021215 SOURCE CODE: UR/0294/66/004/003/0380/0388

AUTHOR: Bobkov, V. P. (Moscow); Ibragimov, M. Kh. (Moscow); Nomofilov, Ye. V. (Moscow); Subbotin, V. I. (Moscow)

ORG: none

TITLE: Investigation of spatial correlation coefficients and transverse temperature excitation scales in the turbulent flow of mercury in a round tube

SOURCE: Teplofizika vysokikh temperatur, v. 4, no. 3, 1966, 380-388

TOPIC TAGS: turbulent flow, Reynolds number, thermocouple, liquid metal, mercury

ABSTRACT: Temperature fluctuations in a turbulent flow of mercury were investigated in the Reynolds number range of 10,000 to 125,000. A pair of thermocouples were used at various positions in the stream and the spatial correlation coefficient was measured. The results are tabulated and graphed. The correlation coefficients were found to approach zero in the center of the stream and their change with the Reynolds number was noted to be greatest at the center. This is taken to indicate the strong dependence of the walls on the turbulence of the flow. The results indicate that transverse variations in temperature fluctuations are similar to those of velocity fluctuations and their scale is comparable to the stream transverse dimension. The analysis of the results is accompanied by an extensive review of turbulence theory

UDC: 532.5.071.4

Card 1/2

L 01676-67 EWT(c)/EWP(k)/EWT(d)/EWT(m)/T/EWP(v)/EWP(t)/ETI/EWP(l) IJP(c)

ACC NR: AP6021525 WW/JD/JG/JR SOURCE CODE: UR/0089/66/020/006/0482/0485

AUTHOR: Subbotin, V. I.; Kozlov, F. A.; Ivanovskiy, N. N.; Makarov, V. M.

ORG: none

TITLE: Detection of leaks in steam generators of the sodium-water type

SOURCE: Atomnaya energiya, v. 20, no.6, 1966, 482-485

TOPIC TAGS: liquid metal cooled reactor, sodium, hydrogen, nuclear reactor technology, nuclear safety

ABSTRACT: After showing that the most sensitive method of detecting small leaks from the steam generator is one based on the diffusion of hydrogen from the sodium into vacuum, the authors describe the construction of two pickups, one used in the liquid-sodium stream and the other in the gas space over the circulating sodium, and the test loop for this purpose (Fig. 1). The experimental procedure, the calibration, and the plotting of the pickup characteristics are described. The characteristics of the entire system are obtained as functions of the temperature, the hydrogen concentration in the sodium, and the velocity of the flowing sodium. The results show that the penetration of the hydrogen from the gas phase into the pickup and from the sodium into the pickup is approximately the same for a given concentration. Both pickups begin to detect the presence of hydrogen at sodium temperatures higher than 360C. The pickup placed in the gas over the sodium, however, exhibited a larger time delay and gave less unambiguous results as a function of the sodium hydride content in the

Card 1/2 UDC: 621.039.534.6: 621.039.534: 44

L 04676-67
ACC NR: AP6021525

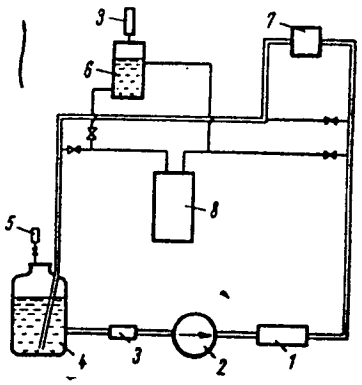


Fig. 1. Diagram of installation. ═══ Main loop, ——— auxiliary loop; 1 - heater, 2 - centrifugal pump, 3 - hydrogen pickup, 4 - pump tank, 5 - water and hydrogen supply, 6 - auxiliary tank with gas volume, 7 - oxide indicator, 8 - sodium trap.

sodium, and a greater dependence on the sodium velocity was observed. It is concluded that by making use of the unique dependence of the penetrability of hydrogen from sodium through nickel into vacuum it is possible to produce an instrument which not only detects leakage from the steam generator, but also determines continuously and remotely the content of the hydrogen in the sodium and in other reactor coolants. Orig. art. has: 5 figures, 3 formulas, and 1 table.

SUB CODE: 18/ SUBM DATE: 30Dec65/ ORIG REF: 004/ OTH REF: 003

Card 2/2

L 44225-66

ACC NR: AP6024536

with S/d = 1.05 in a longitudinal flow of a coolant. A. M. Barabanov participated in the investigation. Orig. art. has: 4 figures and 14 formulas. [AV]

SUB CODE: 18/ SUBM DATE: 08Dec65

Card 2/2 MIT

L 06457-67 EWT(m)/EWP(t)/ETI IJP(c) JD/WW/JG
ACC NR: AP6024537 SOURCE CODE: UR/0089/66/021/001/0017/0022

AUTHOR: Subbotin, V. I.; Ivanovskiy, M. N.; Milovanov, Yu. V. 82 B

ORG: none

TITLE: Diffusion-chemical and phase resistance in the condensation and evaporation of alkaline metals

SOURCE: Atomnaya energiya, v. 21, no. 1, 1966, 17-22

TOPIC TAGS: liquid metal, alkali metal, nuclear reactor coolant, heat transfer, pressure effect, physical diffusion, heat balance

ABSTRACT: The authors analyze in greater detail the now-current scheme, whereby alkaline metals evaporate by surface emission of monoatomic molecules only, and that dimerization takes place only after the evaporation. An analysis of the thermodynamic equations and comparison with earlier experimental data (Teplofizika vysokikh temperatur v. 2, no. 4, 1964) show that this scheme is valid only at higher pressures and that the evaporation or condensation of alkaline metals at supersaturated-vapor pressures of 1 - 100 mm Hg must proceed via surface emission (or absorption) of both monoatomic and diatomic molecules. At these lower pressures the dimerization (or dissociation of molecules is a result of a chemical reaction occurring on the surface of the liquid. The existence of a transition region between high and low pressures, in which the condensation coefficient changes from zero (at high pressures) to unity (at low pressure), is proposed. The diffusion-chemical resistance depends on the kinetics of

Card 1/2 UDC: 621.039.517.5

L 10331-67
ACC NR: AP6029797

0

the determination of the temperature fields and heat-transfer coefficients. The constants involved in the equations for the stress distributions are obtained from experimental data, and the results are compared with data on channels with eight different cross sections. Agreement between the calculations and experiment was found to be within 10%. Orig. art. has: 6 figures, 13 formulas, and 1 table.

SUB CODE: 20, 18/ SUBM DATE: 28Dec65/ ORIG REF: 005/ OTH REF: 005

Card 2/2

ACC NR: AF7002171 SOURCE CODE: UR/0089/66/021/006/0513/0514

AUTHOR: Ibragimov, M. Kh.; Merkulov, V. I.; Subbotin, V. I.

ORG: none

TITLE: Random thermal elastic stresses produced in a wall by temperature pulsations

SOURCE: Atomnaya energiya, v. 21, no. 6, 1966, 513-514

TOPIC TAGS: elastic stress, thermal stress, heat transfer, nuclear reactor technology

ABSTRACT: In view of the importance of temperature pulsations on the heat-transfer walls of heat exchangers, the authors present an approximate method of calculating the intensity of random thermal elastic stresses produced by random pulsations of the temperature on the boundaries of a solid. The problem is solved in the thin-plate approximation, using a quasistatic analysis, in view of the low frequency spectrum (0.05 - 5 cps) of the pulsations actually occurring in the case of turbulent heat exchange. The problem is solved for an infinite plate with clamped and free edges. In both cases, the intensity of the thermal stresses increases linearly with the intensity of the temperature pulsations. A plot showing the dependence of the intensity of the temperature pulsations on the Reynolds number in the case of heat exchange between liquid metal and water is also presented and it is shown that in actual nuclear reactors or heat exchangers allowance for the additional stresses may be important. Orig. art. has: 2 figures and 7 formulas.

SUB CODE: 18/ SUBM DATE: 20Jun66/ ORIG REF: 005/ OTH REF: 001

Card 1/1 UDC: 621.039.517.5

1(0) PHASE I BOOK EXPLOITATION SOV/1280

Subbotin, Vasiliy Mikhaylovich

Taymernaya model' samoleta (Timer Model Aircraft) Moscow, Izd-vo DOSAAF, 1958. 73 p. (Series: Bibloteka yunogo konstruktora 8,000 copies printed.

Ed.: Yefremova, Ye. V.; Tech. Ed.: Andrianov, B.I.

PURPOSE: This booklet is intended to assist young model aircraft builders in designing, constructing, and regulating timer models.

COVERAGE: The author deals with timer models which have been built in the USSR for several years. He stresses the importance of a knowledge of flight theory and mechanics, of model technique, in addition to manual skill as prerequisites for successful design and construction of timer models. There are no refereneces. No personalities are mentioned.

TABLE OF CONTENTS:

Introduction 3

Card 1/4

Timer Model Aircraft SOV/1280

Designing a Timer Model 5

Recommendations for selecting primary model dimensions 5
The wing 6
Selecting wing profile and empennage 7
Longitudinal stability and area of the stabilizer 9
Directional stability and tail fin area 10
Lateral stability and interaction with directional stability 10
Recommendations for designing models according to the new FAI rules 13
Simple calculation and selection of propellers 15
Geometric characteristics of propellers 15
Diagram characteristics of propeller series 18
Selecting a propeller 19
Drawing propeller patterns 20
Composing the working drawing of a model 21

Card 2/4

Building the Model and Making its Parts 24
The fuselage 26
The wing 29
The stabilizer 32
Landing equipment 33
Power equipment 35
The fuel tank 37
Fuel mixtures 39
The timer 41
The propeller 46
Covering, Finishing and Assembling the Model 48
Covering the model with tissue paper 50
Covering the model with silk or caprone 52
Covering the model with long-fiber paper 52
Model finishing 53
Model assembling 54
Regulating Timer Models 56

SOV/85-58-12-28/38

AUTHOR: Subbotin, Vassiliy M., Public Instructor; Master of Sports

TITLE: Honorary Office (Pochetnaya dolzhnost')

PERIODICAL: Kryl'ya rodiny, 1958, Nr 12, pp 22-23 (USSR)

ABSTRACT: The author, 1955 Soviet Champion in model aircraft building, Communist party member and technician of the Moskovskiy mashinostroitel'nyy zavod (Moscow Machine Building Plant) is also instructor in model aircraft building at School Nr 642 in Moscow. His diary, which covers the period between December 1954 and April 1958, deals with the progress made by the group. There is 1 photograph.

Card 1/1

SUBBOTIN, V. K.

"The Processes of Digestion of Calves During Paratyphus and a Basis for Treating Paratyphus." Cand Vet Sci, Omsk State Veterinary Inst, Omsk, 1954. (RZhBiol, No 5, Mar 55)

SO: Sum. No. 670, 29 Sep 55—Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (15)

SUBBOTIN, V.M., kandidat veterinarnykh nauk.

Pathogenesis and treatment of paratyphoid fever in calves.
Veterinariia 32 no.10:42-45 O '55. (MIRA 8:12)

1.Sibirskiy zonal'nyy nauchno-issledovatel'skiy veterinarnyy institut.
(CALVES--DISEASES) (PARATYPHOID FEVER)

SUBBOTIN, V.M.

Effect of different doses of streptomycin on the secretory and excretory functions of the gastric and intestinal glands. Antibiotiki 8 no.6:535-539 Je '63 (MIRA 17:3)

1. Kafedra farmakologii (zaveduyushchiy - prof. N.P.Govorov) Omskogo veterinarnogo instituta.

SUBBOTIN, V.M.

Modified secretory and excretory function of the gastrointestinal tract following the introduction of chloramphenicol and synthomycin. Farm. i toks. 27 no.4:462-464 Jl-Ag '64.

(MIRA 17:11)

1. Kafedra farmakologii (zav. - prof. N.F. Govorov) Omskogo veterinarnogo instituta.

L 00659-67 EWT(d)/EWT(m)/EWP(w)/EWP(v)/T-2/EWP(k) IJP(c) WW/EM
ACC NR: AP6021468 SOURCE CODE: UR/0413/66/000/011/0087/0087

INVENTOR: Perumina, O. A.; Samusev, I. F.; Subbotin, V. M.

ORG: none

TITLE: A method of measuring the displacement of points of a structure in static tests in thermoaerodynamic tubes. Class 42, No. 182373

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 11, 1966, 87

TOPIC TAGS: aerodynamic test, high temperature aerodynamic test, aircraft structure test, STATIC TEST, TEMPERATURE TEST, AEROSPACE STRUCTURE

ABSTRACT: This Author Certificate introduces a method of measuring the displacement of points of a structure in static tests in thermoaerodynamic tubes. To ensure high precision and reliability of measurements at high temperatures each point is provided with a marker carrying two cylindrical rods mounted at a given distance from each other. The markers are illuminated and photographed prior to and during testing at given periods of time. On a developed negative, the scale for each point is determined and used for measuring the magnitude of the shift of the points. Orig. art. has: 1 figure. [MS]

SUB CODE: 14, 01/ SUBM DATE: 06Jan65/ ATD PRESS: 5040
Card 1/1 UDC: 620.178

RUSAKOV, G.K., kand.sel'skokhoz.nauk; SUBBOTIN, V.P., kand.ekon.nauk; LIPATOVA, V.A., kand.ekon.nauk; ARINA, A.Ye., kand.sel'skokhoz. nauk; KORENYUGIN, G.P., mladshiy nauchnyy sotrudnik; PANKOVA, K.I., aspirantka; KLADCHIKOV, S.M., otv.red.; KOLYCHEV, L.I., red.; SVYADOSTS, Yu.I., red.

[Accounting on collective farms when business accounting is in use] Bukhgalterskii uchet v kolkhozakh pri vnedrenii khozrascheta. Moskva, 1960. 246 p. (MIRA 13:5)

1. Moscow. Vsesoyuznyy nauchno-issledovatel'skiy institut ekonomiki sel'skogo khozyaystva. 2. Zaveduyushchiy otdelom ekonomiki i organizatsii proizvodstva kolkhozov Vsesoyuznogo nauchno-issledovatel'skogo instituta ekonomiki sel'skogo khozyaystva (for Rusakov). 3. Otdel ekonomiki i organizatsii proizvodstva kolkhozov Vsesoyuznogo nauchno-issledovatel'skogo instituta ekonomiki sel'skogo khozyaystva (for Subbotin, Lipatova, Arina). 4. Kashirskiy opornyy punkt Vsesoyuznogo nauchno-issledovatel'skogo instituta ekonomiki sel'skogo khozyaystva (for Korenyugin). 5. Vsesoyuznyy nauchno-issledovatel'skiy institut ekonomiki sel'skogo khozyaystva (for Pankova).
(Collective farms--Accounting)

MITYUSHKIN, T.S., kand. ekon. nauk; SUBBOTIN, V.P.; DVOYRIN, E.Yu.; TUKHANOVA, A.N., red.; CHIZHEVSKAYA, K.M., red.

[Accounting on collective farms] Bukhgalterskii uchet v kolkhozakh. Moskva, Statistika, 1964. 446 p.
(MIRA 18:1)

L 26160-66 EWP(k)/EWT(d)/EWT(m)/EWP(h)/T/EWP(1)/EWP(v) DJ
ACC NR: AP6006351 (A) SOURCE CODE: UR/0413/66/000/002/0085/0085

AUTHORS: Tabachnikov, L. D.; Bugoslavskiy, Yu. K.; Kozin, Yu. V.; Grinshpun, L. V.; Shlyatin, V. S.

ORG: none

TITLE: Device for automatic balancing of a hydraulic boom crane. Class 35, No. 178073

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 2, 1966, 85

TOPIC TAGS: crane, construction equipment, hydraulic system

ABSTRACT: This Author Certificate describes a device for automatic balancing of a hydraulic boom crane. The device contains a counterweight which is movable, depending upon variation of loading. The counterweight is controlled by a pressure hydrocylinder which is linked with cylinder relays set on working elements of the crane. The cylinder relays measure the load and overturn moments. In the trunk line linking the relays with the pressure hydrocylinder of the counterweight there is a distributor valve giving reverse contact for counterweight control with obstruction of the working mechanisms of the crane in case of imbalance (see Fig.1).

Card 1/2 UDC: 621.873.327-755

L 26160-66
ACC NR: AP6006351

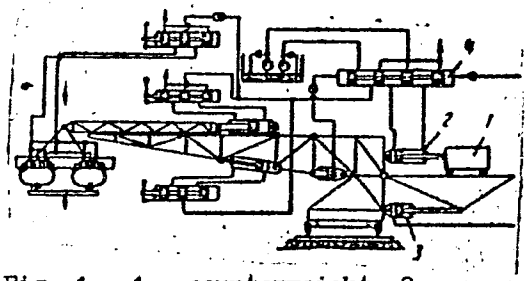


Fig. 1. 1 - counterweight; 2 - pressure hydrocylinder; 3 - cylinder relays; 4 - distributor valve.

Orig. art. has: 1 figure.

SUB CODE: 13/ SUBM DATE: 04Sep63

Card 2/2

L 20938-66 EWT(d)/EWT(m)/EWP(t)/EWP(l) IJP(c) BB/JD/GG

ACC NR: AP6002566 SOURCE CODE: UR/0286/65/000/023/0059/0060

AUTHORS: Erglis, K. E.; Petrova, L. F.; Subbotin, V. T. 44 13

ORG: none

TITLE: Device for connecting metallic backings of magnetic films to a metallic base. Class 42, No. 176719 19

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 23, 1965, 59-60

TOPIC TAGS: magnetic thin film, computer storage device

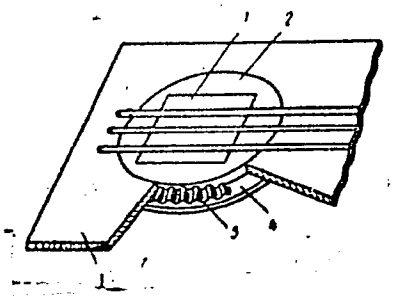
ABSTRACT: This Author Certificate presents a device for connecting metallic backings of magnetic films having parallel control conductors to a metallic base, e.g., to the base of memory power units. To simplify the control of mounting the film relative to the control conductors, the film with the backing is mounted on a circular metallic ring (see Fig. 1). The ring has a shoulder around its circumference and is placed in a hole in the base. A flat crimped metallic contact ring is placed between the shoulder and the surface of the base.

Card 1/2 UDC: 681.14

L 20938-66

ACC NR: AP6002566

Fig. 1. 1 - Film with backing;
2 - metallic ring;
3 - base;
4 - ring shoulder;
5 - contact ring.



Orig. art. has: 1 diagram.

SUB CODE: 09/ SUBM DATE: 16Oct63

Card 2/2

ACC NR: AP6033499 SOURCE CODE: UR/0413/66/000/018/0127/0127

INVENTOR: Erglis, K. E.; Subbotin, V. T.; Krylova, V. I.

ORG: none

16C

TITLE: Magnetic film memory array. Class 42, No. 186202

SOURCE: Izobret prom obraz tov zn, no. 18, 1966, 127

TOPIC TAGS: ferromagnetic film, computer storage, computer memory, thin film memory, magnetic thin film

ABSTRACT: An Author Cerntificate has been issued for a magnetic film memory array with a metallic base and a diode-matrix two-coordinate address selection (see Fig. 1).

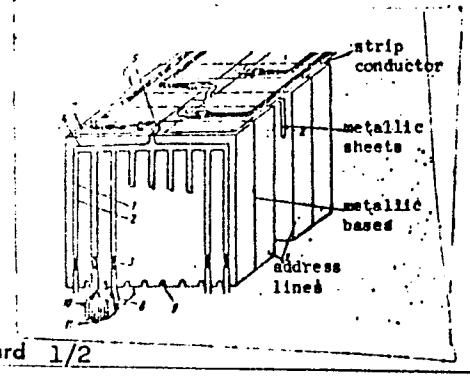


Fig. 1. Film memory array

1 - Metallic bases; 2 - address lines; 3 - decoder diodes; 4 - transverse conductor; 5 - output; 6 - strip conductor; 7 - metallic sheet; 8 - diode output; 9 - slots; 10 - strips; 11 - isolating lining.

Card 1/2

UDC: 681.142.07

ACC NR: AP6033699

Its bit and address lines, which are in the form of strip conductors, change the direction of magnetization of individual memory cells. The metallic sheets are connected to the magnetic film substrates, and the strip conductors are isolated from the substrates by a thin insulating layer. To assure switching current continuity, the metallic base edges on both address outputs are either interconnected by the metallic sheets serving as bases for the strip conductors or are connected to the metallic strips, both of which are tied to the pulse shapers. Orig. art. has: 1 figure.

SUB CODE: 09/ SUBM DATE: 25Feb65/

Card 2/2

ACC NR: AP6033499 SOURCE CODE: UR/0413/66/000/018/0127/0127

INVENTOR: Erglis, K. E.; Subbotin, V. T.; Krylova, V. I.

ORG: none

TITLE: Magnetic film memory array. Class 42, No. 186202

SOURCE: Izobret/prom obraz tov zn, no. 18, 1966, 127

TOPIC TAGS: ferromagnetic film, computer storage, computer memory, tnin film memory, magnetic thin film

ABSTRACT: An Author Cerntificate has been issued for a magnetic film memory array with a metallic base and a diode-matrix two-coordinate address selection (see Fig. 1).

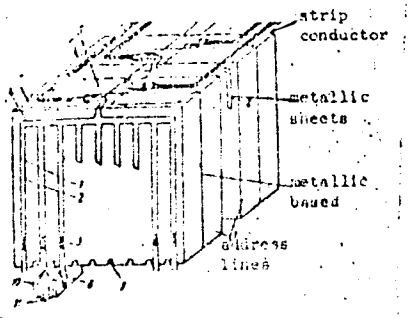


Fig. 1. Film memory array

1 - Metallic bases; 2 - address lines; 3 - decoder diodes; 4 - transverse conductor; 5 - output; 6 - strip conductor; 7 - metallic sheet; 8 - diode output; 9 - slots; 10 - strips; 11 - isolating lining.

Card 1/2 UDC: 681.142.07

ACC NR: AP6033[illegible]

Its bit and address lines, which are in the form of strip conductors, change the direction of magnetization of individual memory cells. The metallic sheets are connected to the magnetic film substrates, and the strip conductors are isolated from the substrates by a thin insulating layer. To assure switching current continuity, the metallic base edges on both address outputs are either interconnected by the metallic sheets serving as bases for the strip conductors or are connected to the metallic strips, both of which are tied to the pulse shapers. Orig. art. has: 1 figure.

SUB CODE: 09/ SUBM DATE: 25Feb65/

Card 2/2

TOPIC TAGS: gas turbine disk, temperature field, heat exchange

TRANSLATION: A solution is given for the problem of determining the temperature [illegible] air flows and the heat exchange along the lateral surfaces is asymmetrical, [illegible] of intense boiling and when there are cold air flows to and [illegible]

SUB CODE: IP, ID ENCL:

Card 1/1

1. SUBBOTIN, V.YE., ENG.

2. USSR (600)

4. Voronezh Province - Clay

7. Organizing cyclic work at the mine No. 2 of the "Orlov log" mine of the Voronezh Mine Administration. Ogneupory 17 no.9, 1952.

9. Monthly List of Russian Accessions, Library of Congress, January 1953. Unclassified.

18(5)

SOV/132-59-4-6/17

AUTHOR: Koblents, E.L., Subbotin, V.Ye. and Tatarskiy, D.I.

TITLE: On the Application of the Coefficient of Ore Contents.

PERIODICAL: Razvedka i okhrana nedr, 1959, Nr 4, p 22-24 (USSR)

ABSTRACT: In connection with the article by M.Ya. Stolyar in Nr 12 (1956) of this periodical, the authors discuss the advisability of the application of the coefficient of ore contents, taking the Sadon polymetallic ore deposit as an example. This deposit is characterized by the irregular distribution of ore components, and the coefficient of ore conents is widely used for the calculation of ore reserves. Both linear and surface coefficients are used. The linear coefficient is calculated by the following formula:

Card 1/3

On the Application of the Coefficient of Ore Contents

$$K_r = \frac{(l - l_1) + (z - z_1)}{l + z}$$

K_r being the coefficient of ore contents; l - the length of the upper base of the computed block; l_1 - the length of the ore-less part of the upper base of the computed block; z and z_1 being respectively the same definitions for the lower base of the block. The surface coefficient is calculated by the same formula, the length being replaced by the corresponding surfaces. The coefficient is not usually applied to the blocks in which empty rocks can be exactly delimited. The authors cite practical examples which prove that the ore contents were correctly calculated by the application of the coefficient. They consider that, by the application of the co-

On the Application of the Coefficient of Ore Contents

efficient of ore contents, the ore reserves decreases, but the metal reserves remain the same. That means that the contents of metal in the ore has increased. Thus the application of the coefficient of ore contents permits one to extract less ore while the metal contents does not change. There are 4 tables.

ASSOCIATION: Rudnik Sadon (The Sadon Mine)

Card 3/3

SUBBOTIN, Ye.

Plenums and presidiums of the trade-union factory committees.
Sov.profsoiuzy 7 no.8:36-39 Ap '59. (MIRA 12:7)

1. Zaveduyushchiy organizatsionno-massovym otdelom Chelyabinskogo soveta profsoyuzov.
(Chelyabinsk--Employees' representation in management)

S/080/62/035/002/004/022
D204/D302

AUTHORS: Chizhikov, D. M., Rabinovich, B. N., Subbotin, Ye. A. and Korsunskaya, V. N.

TITLE: Separation of fluorine from the rare earths in solutions also containing Ca and Si, by an ion exchange method

PERIODICAL: Zhurnal prikladnoy khimii, v. 35, no.2, 1962, 276-280

TEXT: The aim of the present work was to obtain pure lanthanon oxides M_2O_3 from natural and synthetic solutions containing Ca and Si. Experimental solutions contained 2 - 3 $\sum M_2O_3$, 3 - 12.8 Ca, 0.45 - 1.6 Fe, 0.4 - 0.8 F and 0.5 - 0.75 g/l of Si, in HCl. The natural solutions, in 5% HCl, contained admixtures of Ca, Ba, Fe, Si, Al, Ti and F. Separations were effected on the YK-2(UK-2) cationite (sulphonic acid type, in the H-form). The rare earths were adsorbed quantitatively, while the filtrate leaving the column contained all F and Si, as well as 75 - 80% of the original Ca and

Card 1/3

85 - 95% of the Fe. The lanthanons were then desorbed with 4N HCl. further purification was by the usual oxalate method. The pure oxides contained $<$ 0.1% Ca and a few parts of Fe, Si and Al per 10^4. The dependences of adsorption and desorption of the rare earths on the HCl concentration and rates of elution were investigated, as well as the adsorption capacity of the resin under static and dynamic conditions. It was found that the adsorption increased sharply with decreasing acid concentration, reaching a maximum in 0.4N HCl. This was confirmed by the fall in the static adsorption capacity of UK-2 from ~130 mg in 1.5N HCl to ~0.01 - 0.09 mg $\sum M_2O_3/g$ of UK-2 in 0.4N HCl. The adsorption and desorption processes were fully reversible. Adsorption capacity increased markedly when the solutions were passed through the column slowly, but increased rates of flow shortened appreciably the time of elution. The results are briefly discussed. There are 5 figures, 1 table and 4 references: 1 Soviet-bloc and 3 non-Soviet-bloc. The references to the English-language publications read as follows: O. Samuelson, R. Djurfeldt and A. Scholander, Elementa, 30, 107, (1947); W. Funasaka,

Separation of fluorine ...

S/080/62/035/002/004/022
D204/D302

M. Kawane and T. Kojima, Met. Fac. Eng., Kyoto Univ., 18, 1, 44-50 (1956).

SUBMITTED: July 1, 1960

Card 3/3

ABRAMOVICH, M.N., inzh.; GORSHTEYN, I.I., kand.tekhn.nauk; MASYUK, I.M., inzh.; BOL'SHAKOV, A.A., inzh.; RUDAKOV, L.M., inzh.; FREYDIN, L.M., inzh.; Prinimali uchastiye: SUBBOTIN, Ye.P.; TERTYSHNYY, V.F.; MAKSIMCHIK, N.F.; BOYKO, S.G.

Practices of the Alchevsk sintering plant. Stal' 21 no.10:869-873 O '61. (MIRA 14:10)

1. Alchevskiy metallurgicheskiy zavod i Voroshilovskiy gornometallurgicheskiy institut.
(Voroshilovsk--Sintering)

AUTHORS: Komaishko, G.S., Matviyenko, V. I., SOV/89-5-1-6/28
Permyakov, V. M., Subbotin, Ye. S., Feofilov, O.G.

TITLE: On Some Methods Employed for the Mass Production of Po-α-Be Neutron Sources (O nekotorykh metodakh massovogo izgotovleniya Po-α-Be neytronnykh istochnikov)

PERIODICAL: Atomnaya energiya, 1958, Vol. 5, Nr 1, pp. 64-67 (USSR)

ABSTRACT: For the production of Po-α-Be neutron sources one of the wet methods is, above all, described. This method consists in the production of a uniform mixture of polonium and beryllium by causing a polonium solution combined with nitric acid to act upon beryllium powder. The mixture obtained is dried and pulverized. A method is described by means of which it is possible to obtain nitric acid polonium free from a copper carrier. In view of its high degree of neutron activity existing during the entire technical production process, the method described is, however, unsuited for the mass production of the preparation concerned. For mass production a method developed by Brean, Hertz, which was improved by the authors, is very well suited. Copper powder

Card 1/2

On Some Methods Employed for the Mass Production of Po-α-Be Neutron Sources

SOV/89-5-1-6/28

containing a known quantity of polonium 210 is weighed into a container, which is then filled with beryllium powder. During the following heating of the hermetically closed container the polonium is sublimated, after which it is uniformly distributed in the mixture. By employing this method it is possible, without any danger to the operating staff, to produce neutron preparations up to $2,1 \pm 0,2 \cdot 10^6$ n/sec from 1 C polonium 210. There are 2 figures and 7 references, 1 of which is Soviet.

SUBMITTED: June 17, 1957

1. Neutrons--Soruces 2. Mixtures--Preparation 3. Polonium --Properties 4. Copper powder--Properties 5. Beryllium powder --Properties

Card 2/2

SUBBOTIN, Yu.N.

Relation between finite differences and the corresponding derivatives. Trudy Mat. inst. 78:24-42 '65. (MIRA 18:12)

SOV/126- -7-5-9/25

AUTHORS: Vlasov, V.V., ~~Subbotin, Yu.S.~~ and Babushkin, V.I.

TITLE: Investigations Relating to Defectoscopy of Railroad Rails in Moving Magnetic Fields. 14. On Applying a Magnetic Memory in the Defect Checking of Rails (Issledovaniya po defektoskopii zheleznodorozhnykh rel'sov v dvizhushchikhsya magnitnykh polyakh. 14. O primenenii magnitnoy pamyati pri kontrole rel'sov)

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 7, Nr 5, pp 689-693 (USSR)

ABSTRACT: This is one of a long series of articles on the subject of detection of rail failures by means of magnetic fields moving at speeds which are acceptable in normal railroad operation. In the case of a speed of 45 km/hr, the rail test truck travels a distance of 12.6 m in one sec; and in the case of travelling at a speed of 90 km/hr it traverses the same distance in half a second. In the given cases the duration of the signals produced by transverse cracks in the railheads are 4 and 2 msec respectively. During that time it is necessary to record not only the presence of an electromagnetic disturbance above the defective parts of the rail but it is also necessary to determine its character, i.e. the

Card 1/3

Investigations Relating to Defectoscopy of Railroad Rails in Moving Magnetic Fields. 14. On Applying a Magnetic Memory in the Defect Checking of Rails

shape of the e.m.f. induced in the search equipment of the defectoscope. At present such defectoscope equipped vehicles are fitted with an optical method of recording signals from the defects onto a normal negative cinefilm. The authors propose to substitute this by recording on a magnetic tape. The block schematics of the recording circuit are shown in Fig 1. A single 6.35 mm wide tape is used for recording the signals induced by both rails of the track. The kilometre markings are produced by changing the amplitudes of the signals by means of plates placed onto the sleepers. A schematic diagram of the signal reproduction mechanism is shown in Fig 5. Experiments have shown that the signals produced by defects of rails and also by other metallic components of the truck can be satisfactorily detected from the magnetic tape recordings. Any part of the recording can be analysed in detail by keeping the tape still relative to the rotating disc carrying the reproduction heads. If the tape moves at a certain speed relative to these

SOV/126-7-5-9/25

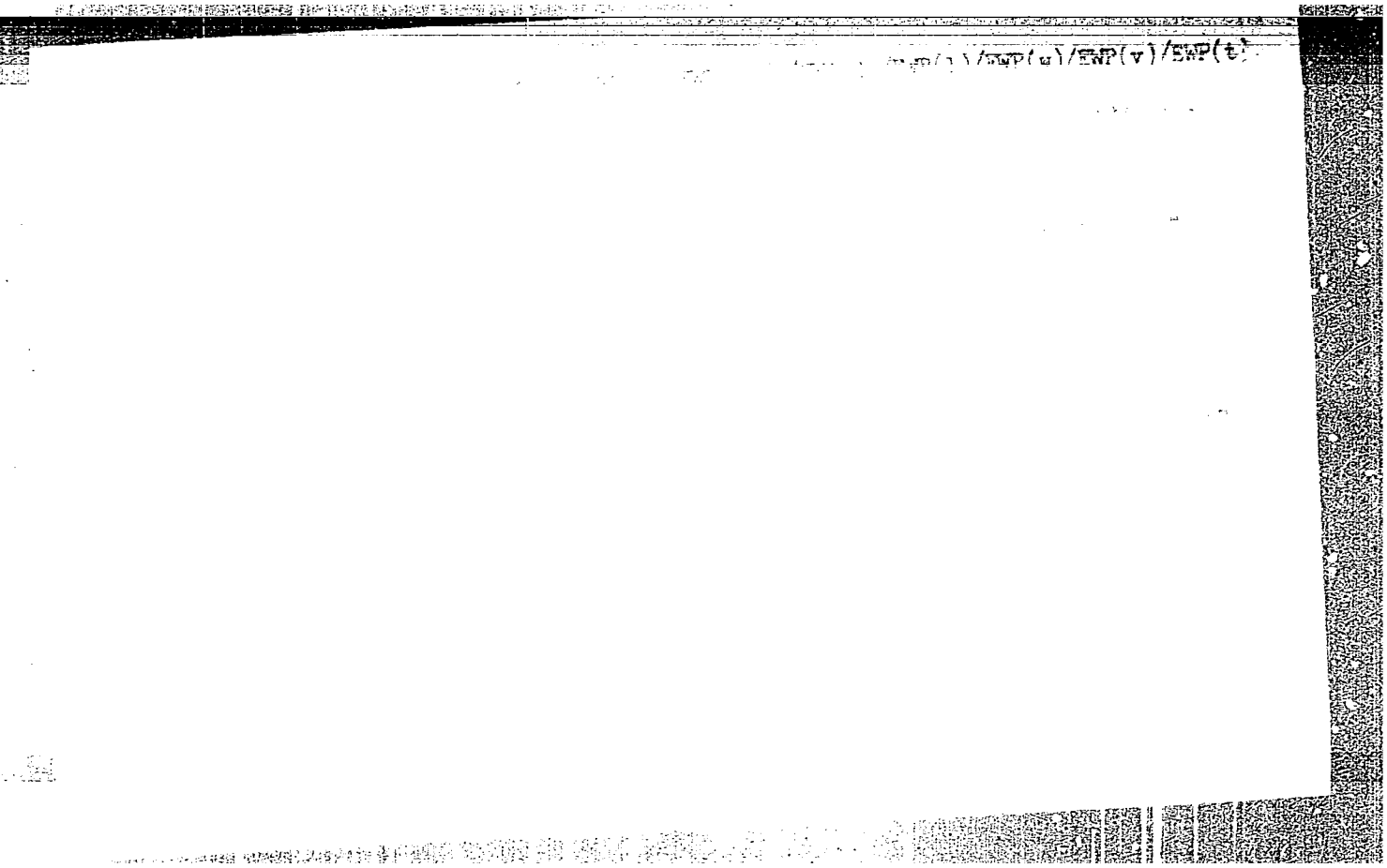
Investigations Relating to Defectoscopy of Railroad Rails in Moving Magnetic Fields. 14. On Applying a Magnetic Memory in the Defect Checking of Rails

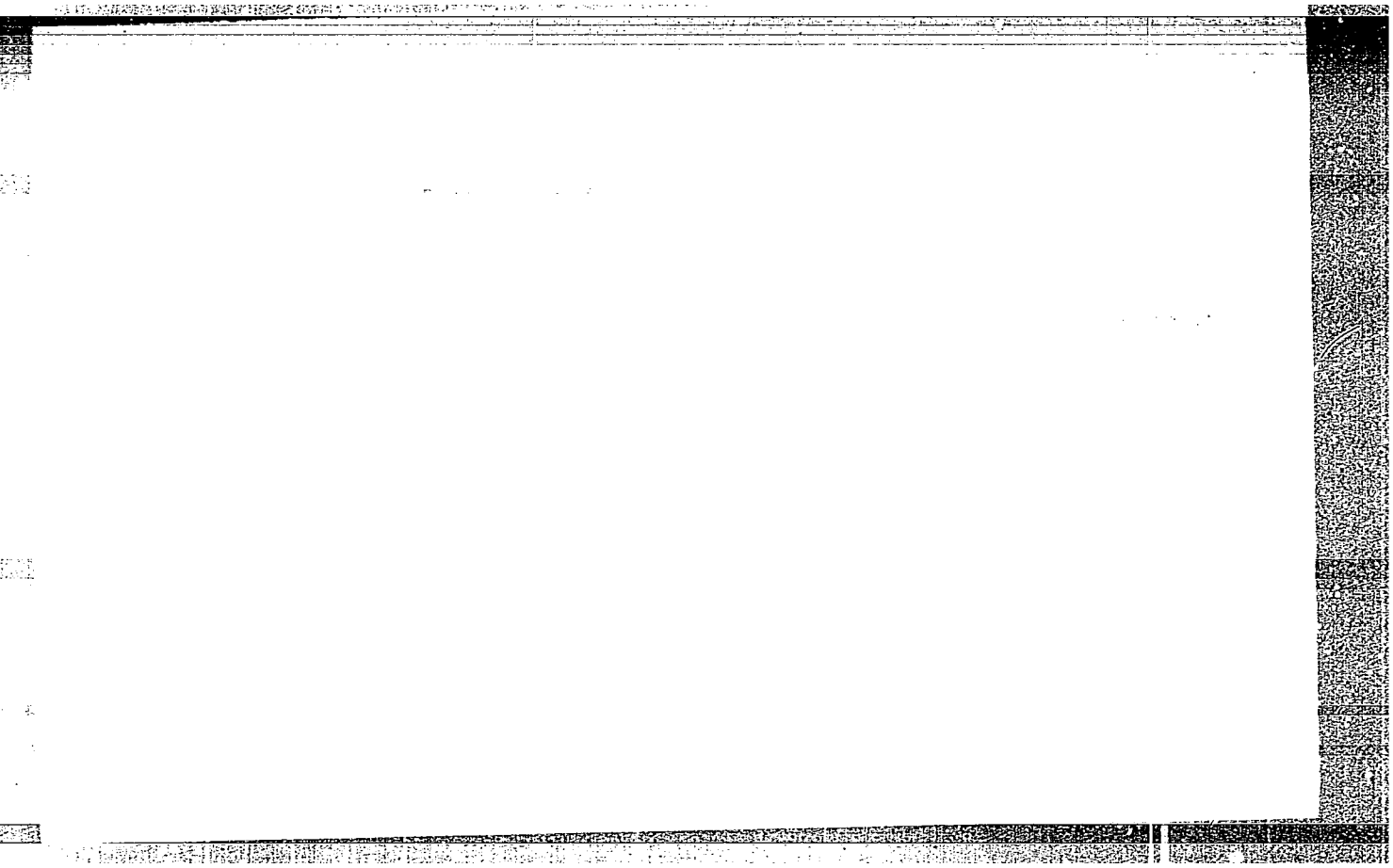
rotating reproduction heads, the signals recorded can be read off. The tape recordings allow easy amplification of the e.m.f. curves in amplitude as well as in time. The first is achieved by controlling the amplification, the second by increasing the scanning speed. Consequently, the magnetic tape is a considerably more flexible tool for detecting rail defects than cinefilm recordings.

Card 3/3 There are 5 figures and 7 references, 5 of which are Soviet, 1 English and 1 International.

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Metal Physics, Ac.Sc. USSR)

SUBMITTED: August 12, 1958





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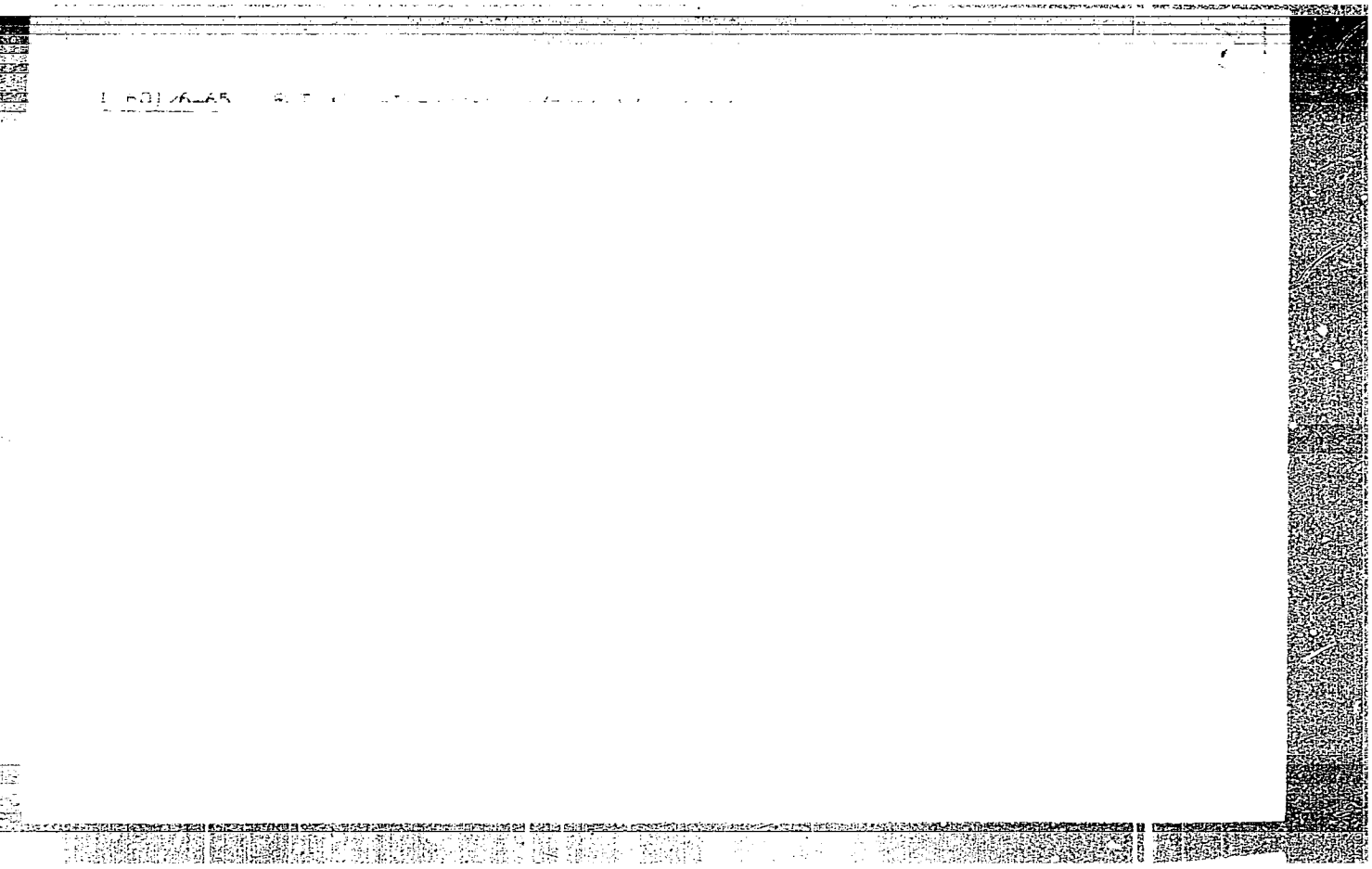

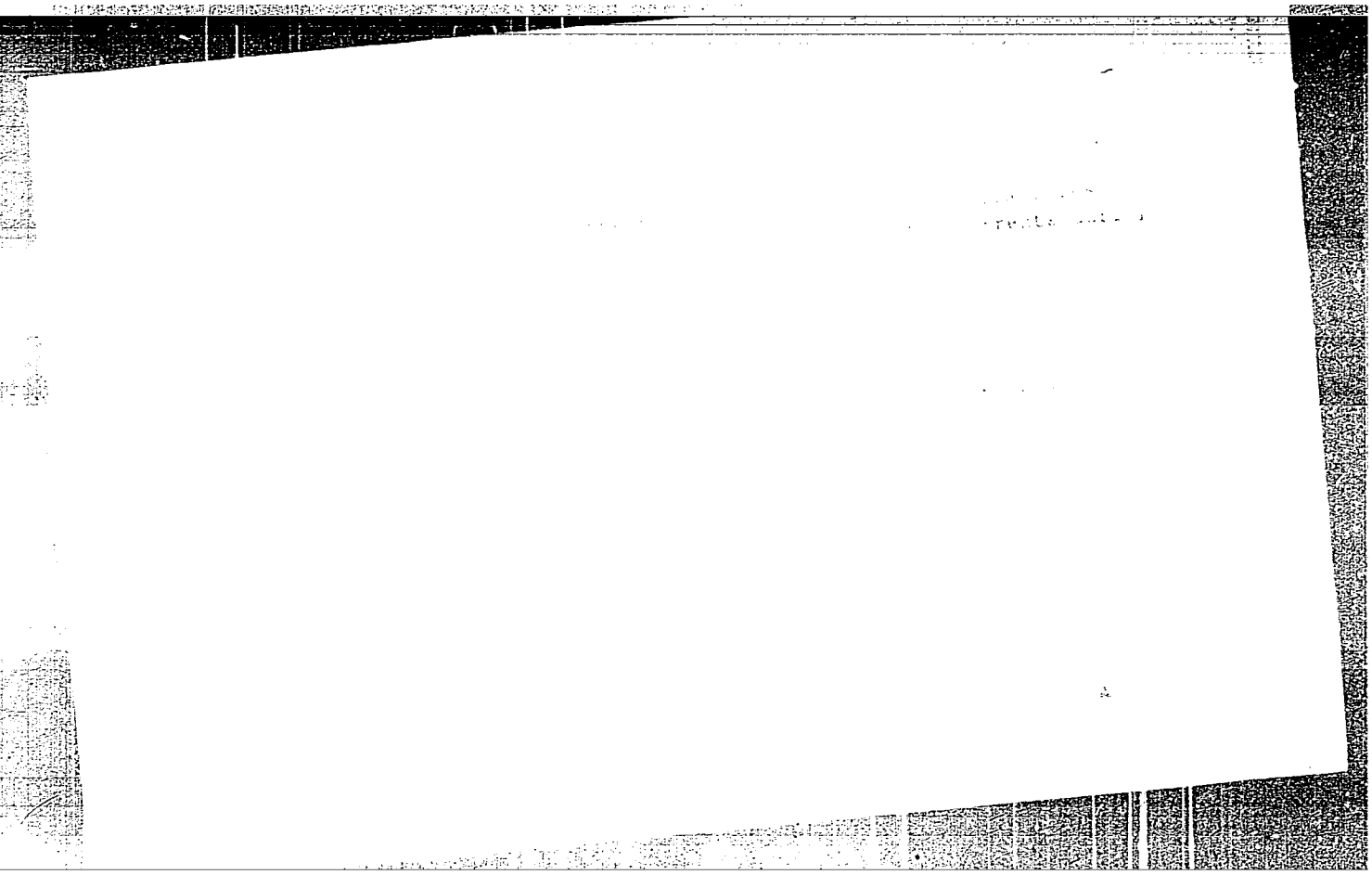

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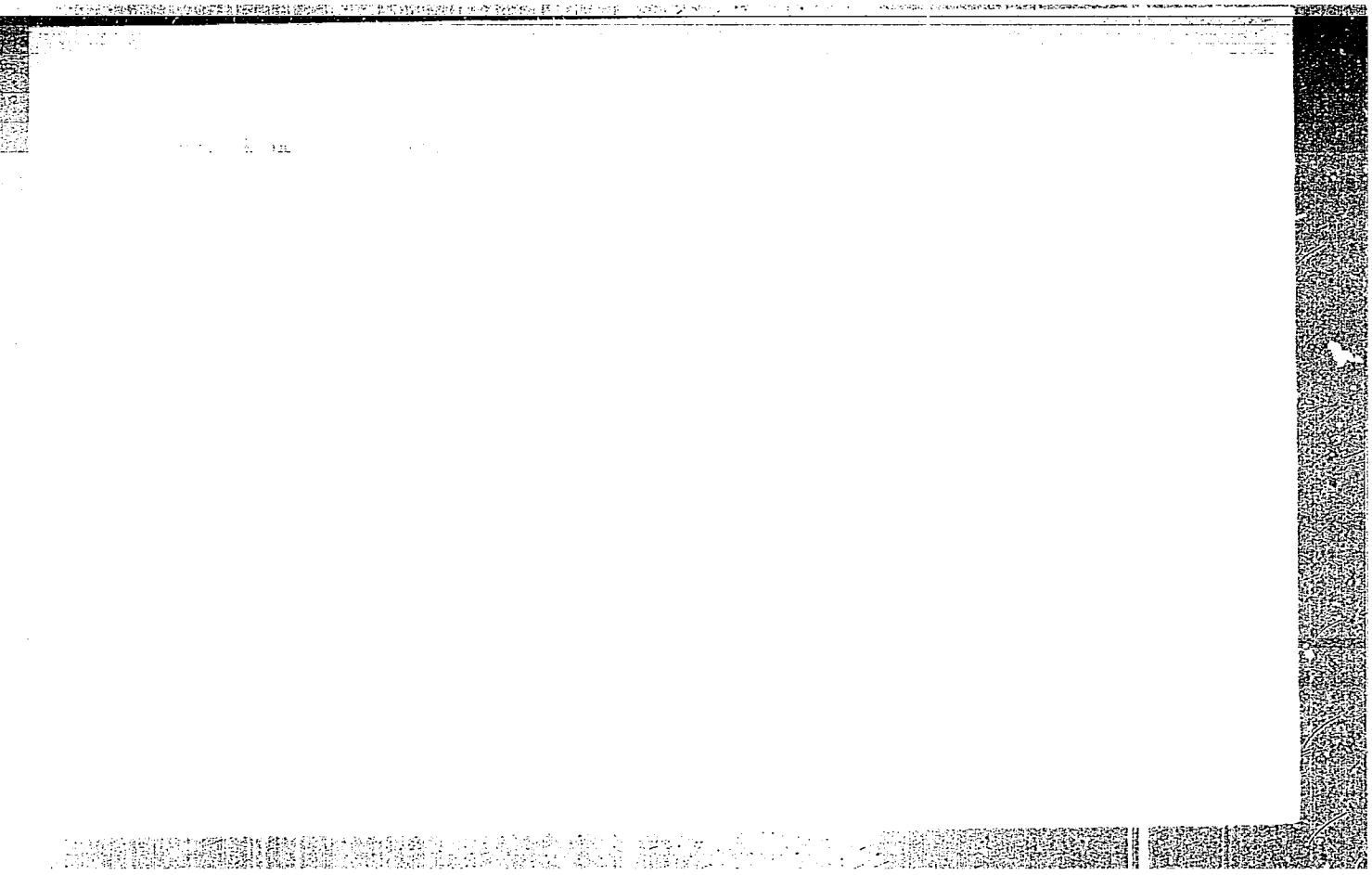
AUTHOR: Vlasov, V. V.; Sobbot(n), Yu. S.



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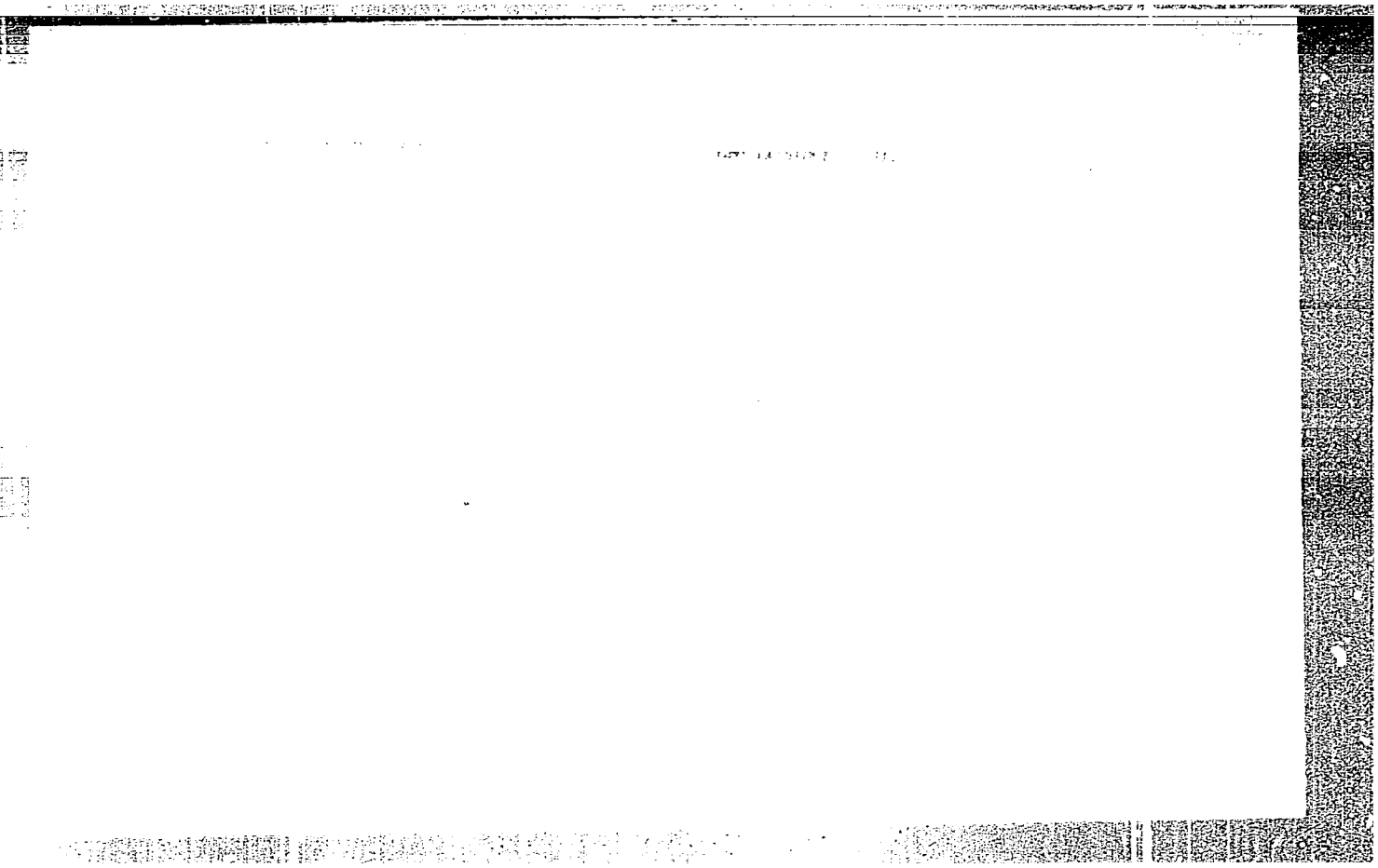

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3607
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A006/A101

1 y 300

AUTHORS: Ignat'yeva, V. S., Candidate of Technical Sciences, Subbotin, Yu. V., Engineer

TITLE: On the problem of determining deformations developing during the cooling of metal in the brittle temperature range

PERIODICAL: Svarochnoye proizvodstvo, no. 4, 1962, 28-30

TEXT: The authors analyze errors which they believe have been committed in the investigation and calculation of deformation kinetics during welding by Lashko, Lashko-Avakyan, Prokhorov and Rykalin (Ref. 1 - 4). A system for determining metal deformation in the heat-affected zone at 0.5 - 5.8 mm distance from the weld, is rejected. Some basic errors have also been made when developing a system for measuring deformations. A graph is reproduced which shows that its curves represent impracticable deformation processes. A conclusion drawn on the "heat-support" of the weld metal during the deformation of the weld joint is rejected as impossible and the terminology employed is found to be inexact. In discussing the possibility of evaluating analytically deformation concentrations of weld metal in the brittle temperature range, Lashko and Lashko-Avakyan

X

Card 1/2

ACC NR: AT6030946 (N) SOURCE CODE: UR/0000/66/000/000/0227/0242

AUTHORS: Makarov, E. L. (Candidate of technical sciences); Subbotin, Yu. V. (Engineer); Prokhorov, N. N. (Doctor of technical sciences)

ORG: none

TITLE: Means for increasing the resistance of steels to the formation of cold cracks during welding

SOURCE: Moscow. Vysshaye tekhnicheskoye uchilishche. Prochnost' svarnykh konstruktsiy (Strength of welded structures). Moscow, Izd-vo Mashinostroyeniye, 1966, 227-242

TOPIC TAGS: weld effect, weld evaluation, metal welding, welding equipment, welding technology, metal bonding

ABSTRACT: An analysis was made and an experimental study was conducted to determine means for increasing the resistance of steels to the formation of cold cracks during welding. Basically, nine methods are identified: 1) the rational alloying of basic and built-up metal; 2) the selection of weld materials of a defined content with minimal hydrogen content; 3) the selection of the optimal technology and welding conditions; 4) the processing of the basic metal before welding so as to obtain a favorable base structure; 5) the elimination of the effect of stress concentrators by varying the surface layer properties of the metal; 6) control of the welding thermal cycle; 7) thermomechanical treatment of the weld joint during cooling in the welding

Card 1/2

ACC NR: AT6030946

process; 8) thermal treatment of the weld joint immediately after welding; 9) mechanical working at the weld joint immediately after welding. The results of several weld strength tests are presented. In these tests the strength of the welds was measured for a variety of conditions, including hand and automatic welding, use of several types of weld materials and base materials, direct versus alternating current welding, etc. Other tests were for the purpose of contrasting the effect of preliminary cold working on steel in the normalized versus the annealed condition. Failed specimens are shown, a discussion of the various failure mechanisms is presented, and surface conditions are analyzed with respect to their effects on crack formation. Further experimental analyses were performed on commercial steels to determine the effect of the weld-cooling rate on the weld bond. Test results were compared with theoretical studies on the welding thermal cycle. Orig. art. has: 13 figures.

SUB CODE: 11/13/ SUBM DATE: 11Mar66/ ORIG REF: 007/ OTH REF: 014

Card 2/2

PARAKHIN, V.A., kand. tekhn. nauk; FROLOV, V.V., dots., kand.tekhn. nauk; SHORSHOROV, M.Kh., dots., kand. tekhn. nauk; GOSPODAREVSKIY, V.I., inzh.; SUBBOTIN, Yu.V., inzh.; KURKIN, S.A., dots., kand. tekhn. nauk; VINOKUROV, V.A., dots.,kand. tekhn. nauk; KAGANOV, N.L., dots., kand. tekhn. nauk; SHASHIN, D.M., kand. tekhn. nauk; AKULOV, A.I., dots., kand. tekhn. nauk; NAZAROV, S.T., dots., kand. tekhn. nauk; YEVSEYEV, G.B., dots., kand. tekhn. nauk; NIKOLAYEV, G.A., prof., doktor tekhn. nauk, red.; TITOVA, V.A., red.; FUFAYEVA, G.I., red.; CHIZHEVSKIY, E.M., tekhn. red.

[Laboratory work on welding] Laboratornye raboty po svarke. Moskva, Rosvuzizdat, 1963. 274 p. (MIRA 16:8)

1. Nauchno-pedagogicheskiy kollektiv Kafedry svarochnogo proizvodstva Moskovskogo vysshego tekhnicheskogo uchilishcha (for all except Nikolayev, Titova, Fufayeva, Chizhevskiy).
2. Zaveduyushchiy kafedroy "Mashiny i avtomatizatsiya svarochnykh protsessov" Moskovskogo vysshego tekhnicheskogo uchilishcha (for Nikolayev).

(Welding—Study and teaching)

PROKHOROV, N.N., doktor tekhn. nauk; GOSPODARCHUK, V.I., inzh.; SUBBOTIN, Yu.V., inzh.

Investigating transverse deformations of a metal seam in the butt welding process of plates. Svar. proizv. no.9:1-3 S '64. (MIRA 17:12)

1. Moskovskoye vysshoye tekhnicheskoye uchilishche im. Baumana.

SUBBOTINA, A.A., inzhener.

Continuous flow operation in resin distilling, coating, drying and cooling of plywood. Der.prom. 4 no.3:26-27 Mr '55. (MLRA 8:4)

1. Kostromskiy fanernyy kombinat.
(Plywood)

SUBBOTINA, A.A.; NIKOLAYEVA, I.F.; VOLOD'KO, Ye.S.

Manufacture of products out of sawdust without using binders.
Der. prom. 14 no.10:9-10 O '65. (MIRA 18:12)

1. Kostromskoy fanernyy kombinat.

KONDRIKOV, I. N., SOBOLINA, A. I. and SHMIDOV, V. I. (Scientific Research Inst for Chemistry of Gor'kiy State Univ. im N. I. Lobachevskiy)

"Separation of Iron and Cobalt by Ion-Exchange Chromatography"

Isotopes and Radiation in Chemistry, Collection of Papers of 2nd All-Union Sci.Team. Confr. on Use of Radioactive and Stable Isotopes and Radiation in National Economy and Science, Moscow, Izd-vo AN SSSR, 1958, 360pp.

This volume publishes the reports of the Chemistry Section of the 2nd All-Union Sci. Team. Confr. on Use of Radioactive and Stable Isotopes and Radiation in Science and the National Economy, sponsored by Acad. Sci. USSR and Main Admin for Utilization of Atomic Energy under Council of Ministers USSR, Moscow, 4-13 April 1957.

SUBBOTINA, A.I.

AUTHORS: Paramonova, V. I., Mosevich, A. N., Subbotina, A. I. 78-1-16/43

TITLE: The Application of Ion Exchange in the Investigation of the State of the Substance in Solution (Primeneniye ionnogo obmena k izucheniyu sostoyaniya veshchestva v rastvore). IV. The Investigation of the Complex-Formation of Yttrium With Lactic Acid by Means of the Method of "Absorption-Curves" (IV. Izucheniye kompleksoobrazovaniya ittriya s molochnoy kislotoy metodom "krivykh pogloshcheniya").

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol. 3, Nr 1, pp. 88-94 (USSR).

ABSTRACT: From the analogy with complex compounds of the trivalent ions of the rare earths with lactic acid: MeA_3 (A = lactic acid anion) (reference 1) a similar yttrium-compound with lactic acid. YA_3 can be supposed. This was confirmed by the tests carried out by the authors, because yttrium is not absorbed by anionite in solutions with lactate-ions (with pH <5), viz. it does not form any negative complexes. Yet intercomplexes YA_2^+ and Ya^{2+} may possibly still exist in the solution besides the Y^{3+} -ions and the neutral complex YA_3^0.

Card 1/4

The Application of Ion Exchange in the Investigation of the State of the Substance in Solution. IV. The Investigation of the Complex-Formation of Yttrium With Lactic Acid by Means of the Method of "Absorption-Curves".

exchange, and no specific absorption takes place, the γ_+ - values do not depend on the nature of the cationite. 2) It is unimportant which salt is added for the maintenance of the ionic strength (0,2) (NaCl under NH_4Cl); the γ_+-values were equal under corresponding conditions and were easily placed on the curve of dependence of γ_+ on c_A. 3) It resulted from the tests that the γ_+-values depend clearly on c_A (or on lg c_A) and not on the pH of the equilibrated solution (table 1, 2). 4) The calculations of the dependence of $\lg \frac{\gamma_+}{1-\gamma_+}$ of lg c_A showed that the complex cation YA^{2+} could not be proved in the tests carried out by the authors. 5) With medium concentration of the addendum the dominating form was YA_2^+ (of c_A = 0,001 n up to c_A = 0,04 n). 6) The constant of inconstancy of YA_2^+ computed on the strength of the test results according to the formula:

78-1-16/43

The Application of Ion Exchange in the Investigation of the State of the Substance in Solution. IV. The Investigation of the Complex-Formation of Yttrium With Lactic Acid by Means of the Method of "Absorption-Curves".

$K_H = \frac{\gamma_+ \cdot c_A^2}{1 - \gamma_+}$, is equal to $(1,1 \pm 0,4)\ 10^{-5}$. 7) With a surplus of the addendum, when the dominating yttrium-form in the solution is YA_3^0, the cationite shows a small absorption which is due to a graded dissociation $YA_2^0 \rightleftarrows YA_2^+ + A^-$.

There are 4 figures, 2 tables, and 3 Slavic references.

SUBMITTED: June 18, 1957.

AVAILABLE: Library of Congress.

Card 4/4

SOV/78-3-9-19/38

AUTHORS: Korshunov, I. A., Subbotina, A. I., Gnezdov, V. I.

TITLE: The Chromatographic Separation of the Ions of Iron and Cobalt (Khromatograficheskoye razdeleniye ionov zheleza i kobal'ta)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1958, Vol 3, Nr 9, pp 2128-2130 (USSR)

ABSTRACT: The chromatographic separation of the ions of iron and cobalt was carried out with the aid of the radioisotope of iron, Fe^{59}, and of cobalt, Co^{60}. The cationite KU-2 was used as absorbent. The initial solutions have a pH-value of 0,8 - 3. The elution of the iron ions was achieved by means of oxalic acid which forms an oxalate complex with iron. A separation of iron and cobalt is possible by means of the oxalic acid complex of iron. A method of producing radioactive iron oxalate was worked out. The oxalic acid solution of radioactive iron need not contain free oxalic acid.
There are 1 figure, 1 table, and 3 references, 3 of which are Soviet.

Card 1/2

SOV/78-3-9-19/38

The Chromatographic Separation of the Ions of Iron and Cobalt

ASSOCIATION: Nauchno-issledovatel'skiy institut khimii pri Gor'kovskom gosudarstvennom universitete, Laboratoriya radiokhimii (Scientific Research Institute of Chemistry at Gor'kiy State University, Laboratory of Radiochemistry)

SUBMITTED: June 8, 1957

Card 2/2

SUBBOTINA, A.I.; YEFIMOVA, Ye.S.; PETROV, A.M.

Radiometric determination of the peak areas of yield curves obtained in the chromatographic separation of Ag^{+} and Cd^{2+}. Trudy po khim.i khim.tekh. no.1:53-55 '63. (MIRA 17:12)